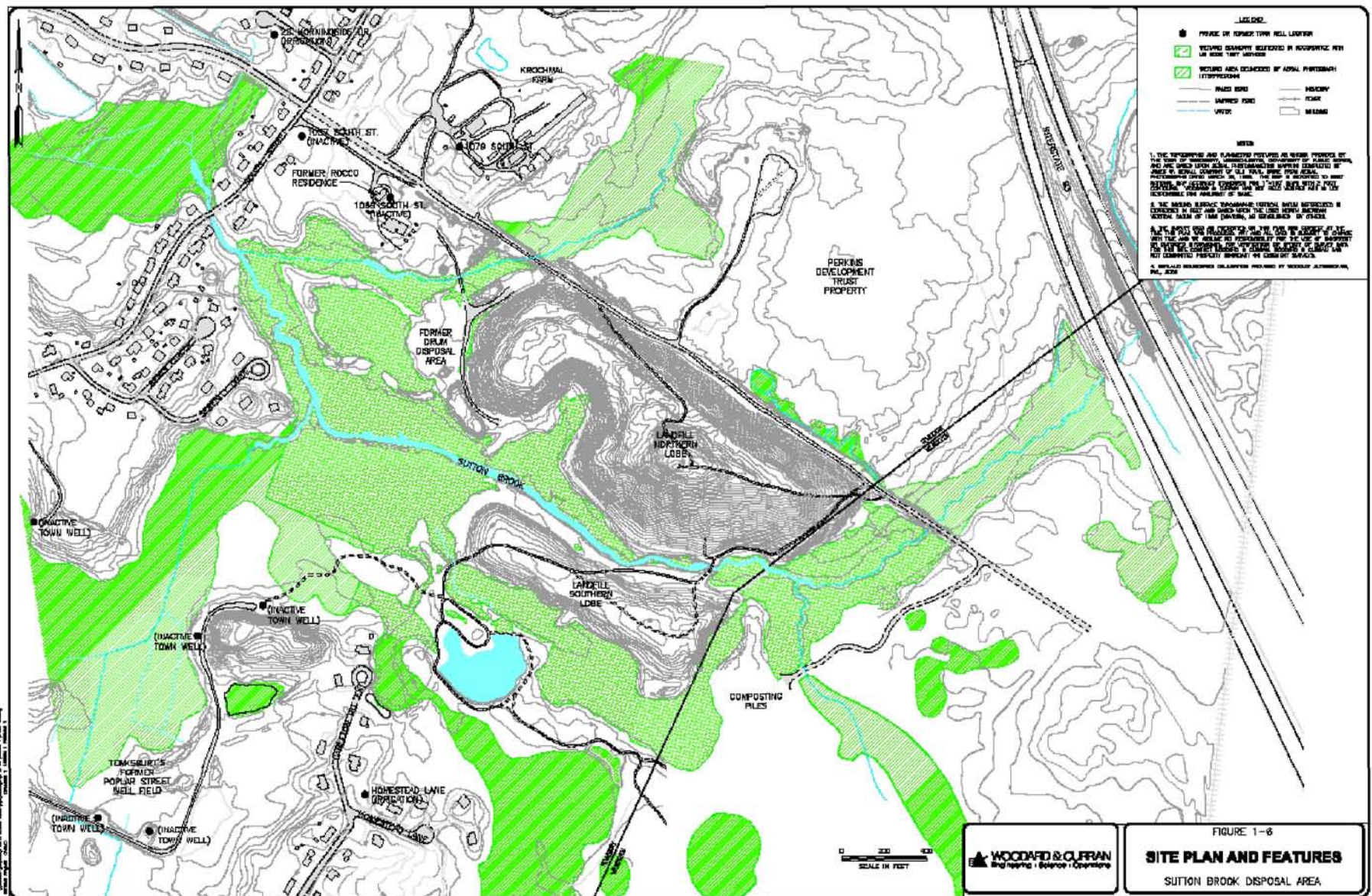


Public Information Meeting EPA's Proposed Cleanup Plan

Sutton Brook Disposal Area
Superfund Site
Tewksbury, MA
June 27, 2007

Agenda

- Welcome and Introductions
 - Don McElroy, USEPA
- Site Status & Background
 - Don McElroy, USEPA
- Superfund and Remedy Selection Process
 - Don McElroy, USEPA
- Remedial Investigation and Risk Assessment Overview
 - Jeff Hamel, Woodard & Curran
- Feasibility Study Overview
 - Jeff Hamel, Woodard & Curran
- EPA's Preferred Alternatives
 - Don McElroy, USEPA
- Questions & Answers



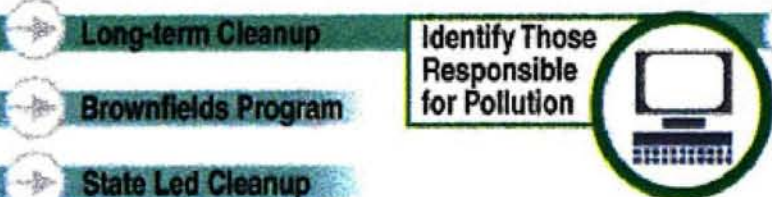
Background and Progress

- 2000 — EPA removes 300 to 400 buried drums and associated contaminated soil, from next to landfill. Additional contaminated soil is stockpiled.
- 2001- Sutton Brook listed as a Superfund Site (NPL)
- 2001-2002 — Potentially Responsible Parties (PRPs) remove contaminated soil pile.
- 2004 — EPA reaches settlement with a group of 25 PRPs: PRPs agree to conduct Remedial Investigation/Feasibility Study.
- 2004-2007 — Remedial Investigation/Feasibility Study conducted to determine extent of contamination and potential cleanup approaches



SUPERFUND

From **Discovery** to **Cleanup**



Short-term actions may be taken to eliminate immediate public health or environmental threats.



What are the Remedial Investigation and Risk Assessment?

- Identifies the type and extent of contamination on the site
- Identifies sensitive populations that may be affected by contamination on the site by preparation of
 - Public Health Risk Assessment
 - Baseline Ecological Risk Assessment

Feasibility Study - Introduction

- Identifies and evaluates potential remedial technologies
- Addresses areas of unacceptable risk identified in the Risk Assessments
- Identifies, screens, and compares remedial options
- Used by EPA to prepare the Proposed Cleanup Plan

Feasibility Study - Process

- Identifies relevant federal and state regulations (“ARARs”)
- Determines site-specific cleanup goals
- Identifies potential remediation technologies
- Screens appropriate technologies
- Assembles applicable cleanup technologies or various combinations of cleanup technologies
- Conducts a detailed evaluation of cleanup technologies
 - Compares to EPA’s nine criteria
 - Compares alternatives to one another

Nine Criteria for Remedy Selection

- Threshold Criteria:
 - Overall Protection of Human Health and the Environment (“Protectiveness”)
 - Compliance with ARARs
- Balancing Criteria:
 - Long-term Effectiveness and Permanence
 - Reduction in Toxicity, Mobility, and Volume
 - Short-term Effectiveness
 - Implementability
 - Cost

Nine Criteria For Remedy Selection

- Modifying Criteria:
 - State Acceptance
 - Community Acceptance
- These are evaluated based on the public comment period

Remedial Investigation Overview

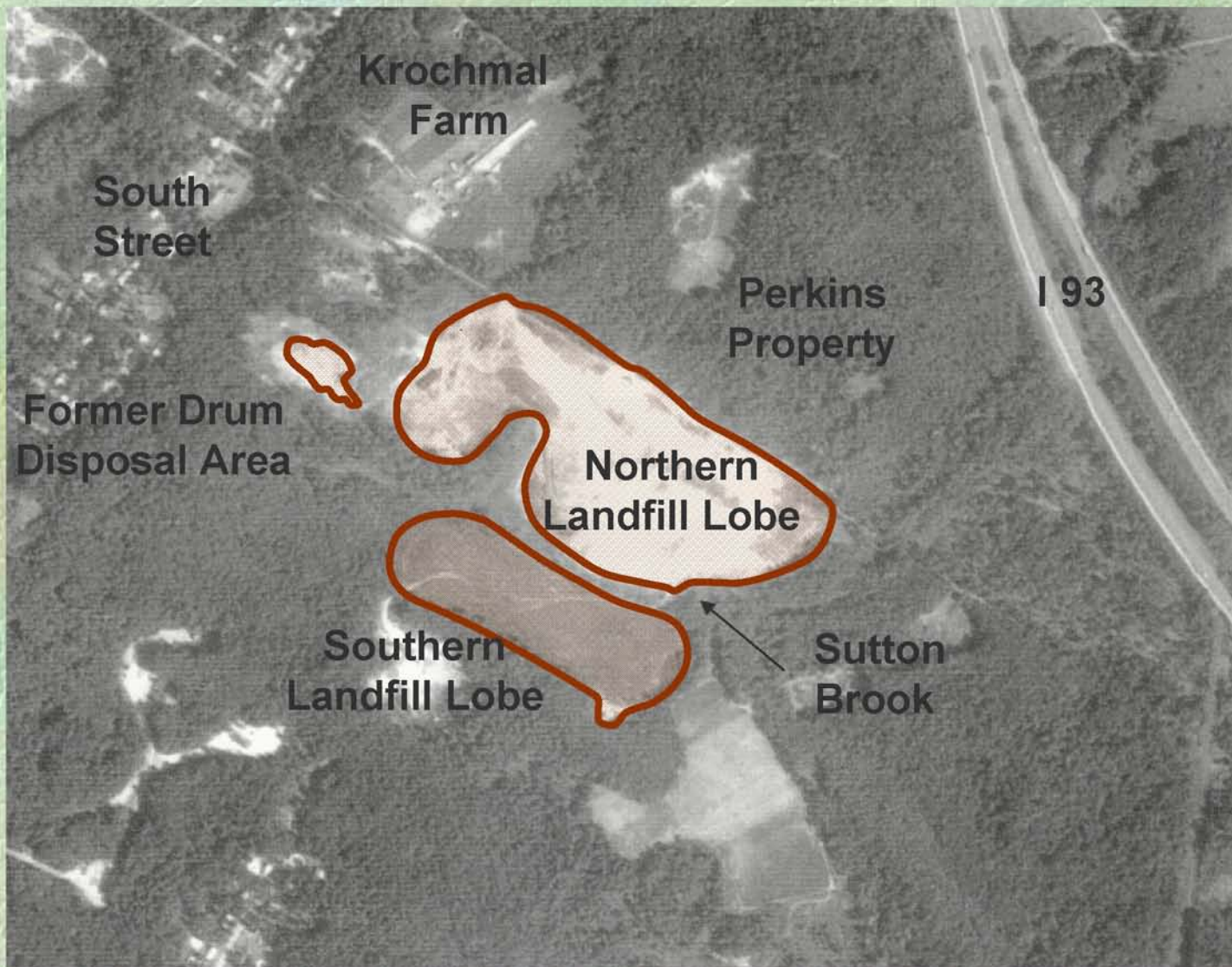
Feasibility Study Overview

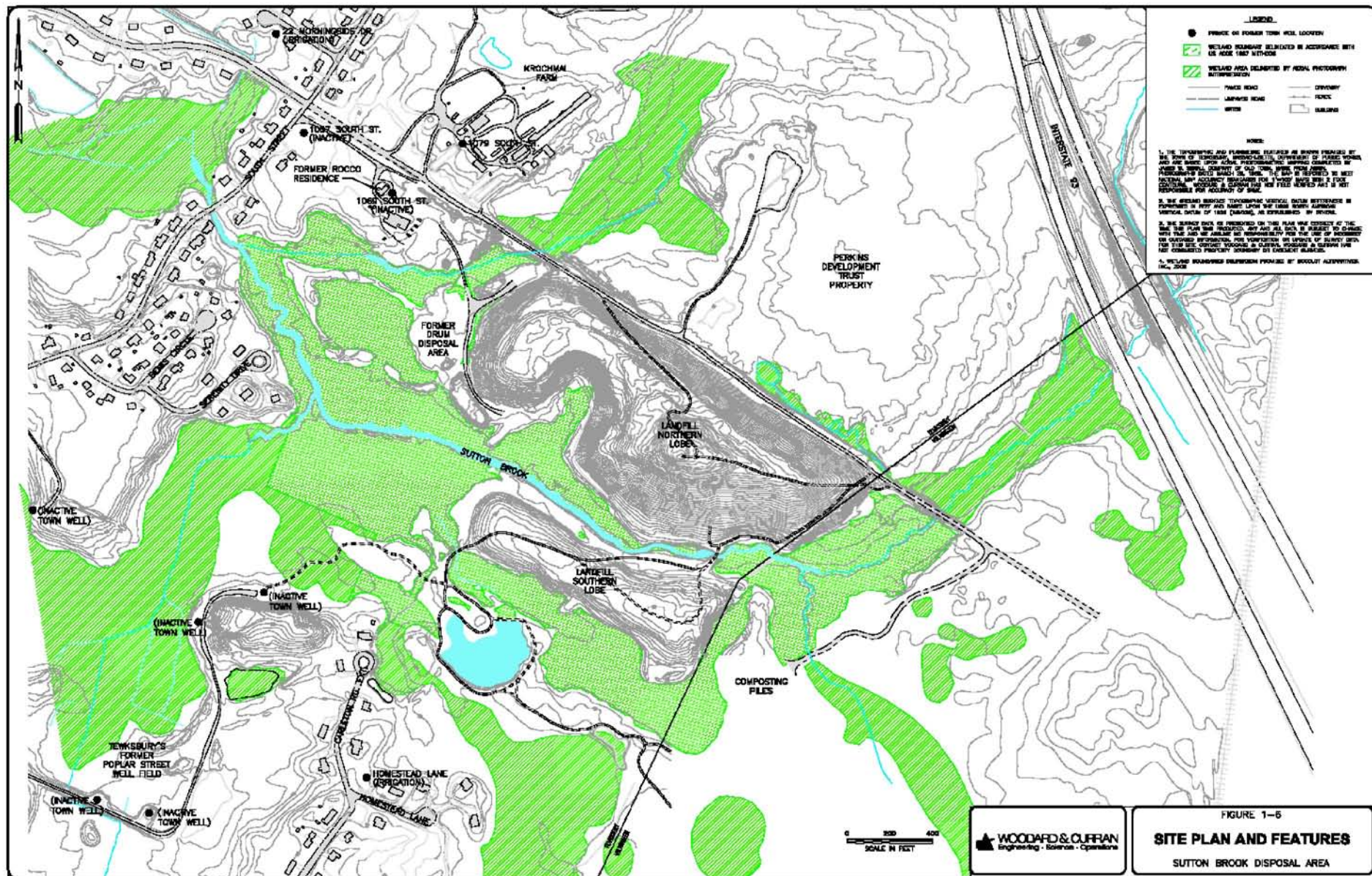
Jeff Hamel

Outline

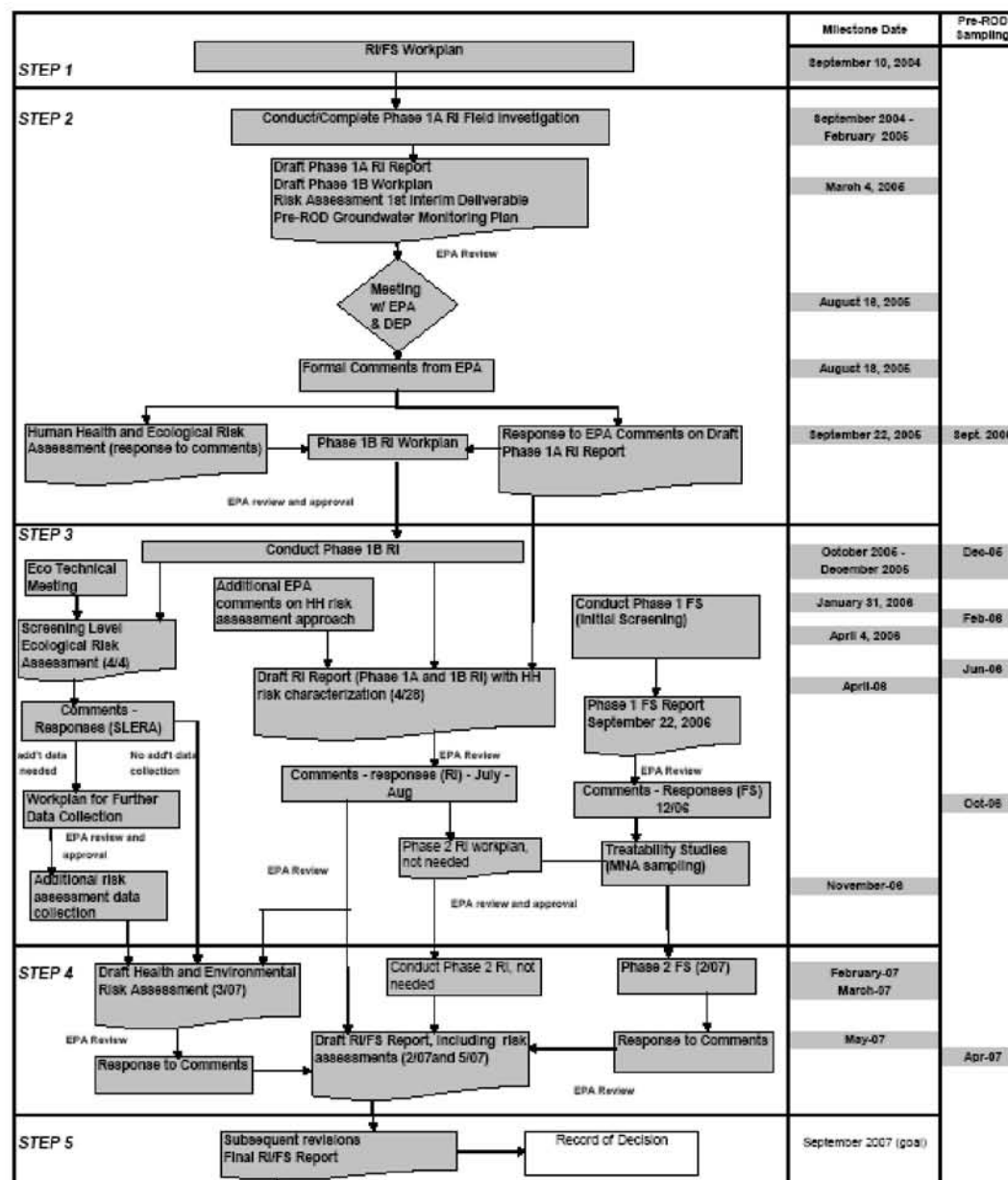
- Site Overview
- RI/FS Milestones/Process
- Remedial Investigation (RI)
- Human Health and Ecological Risk Assessment (HERA)
- Feasibility Study (FS)

Site Overview





REVISED RI/FS MILESTONE SCHEDULE - SUTTON BROOK DISPOSAL AREA SUPERFUND SITE, TEWKSBURY, MA



Shaded cells indicate milestones complete

Date Printed 6/27/2007

RI Findings

RI Components

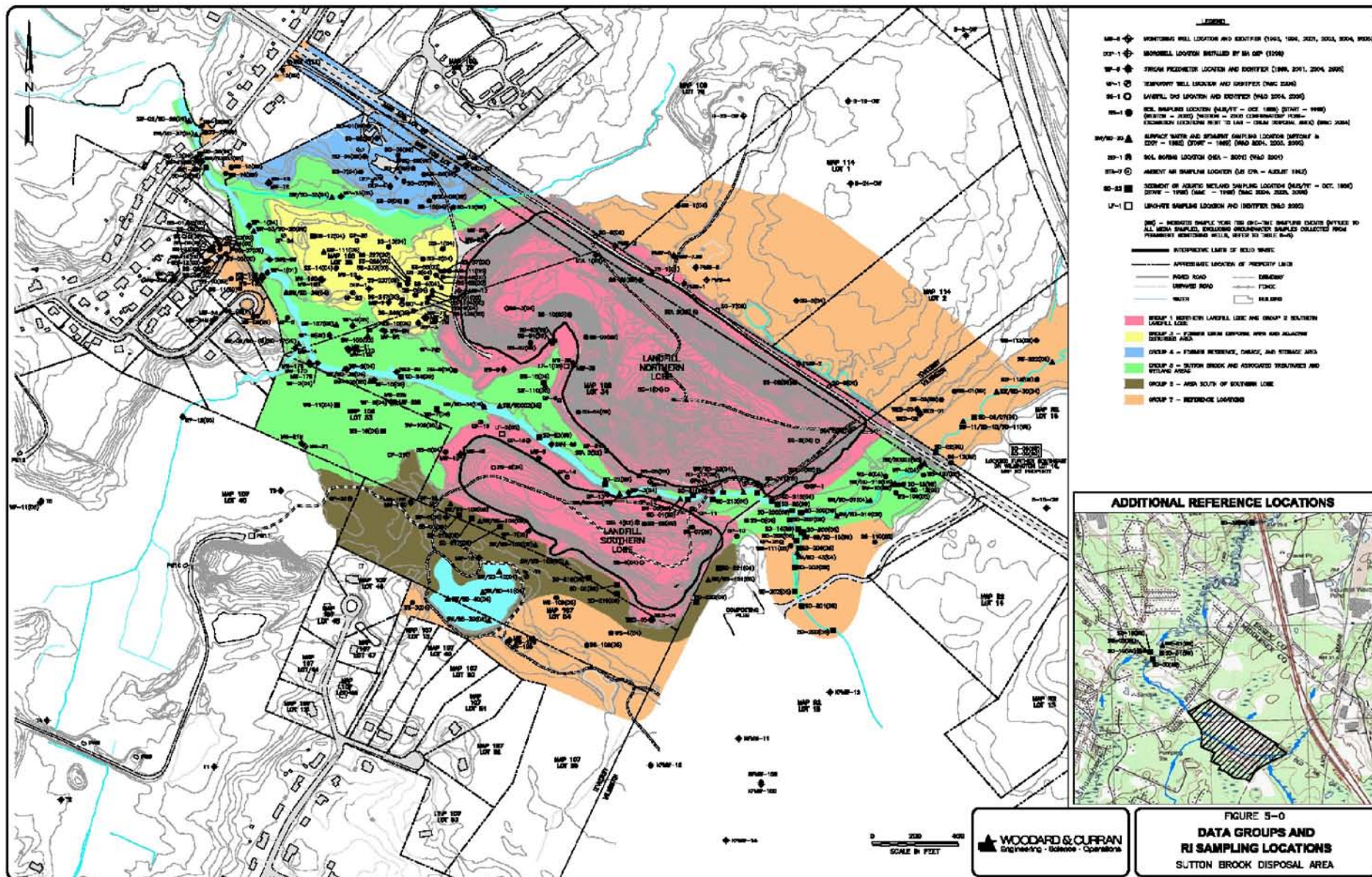
- Evaluate/Integrate Previous Investigation Data (1989 – 2002)
- Landfill Cover Presumption
- Soil and Source Investigation
 - 38 test pit excavations
 - 10 soil borings
 - 2 leachate samples
- Air Quality
 - 5 landfill gas

RI Components

- Groundwater Investigation
 - 25 temporary wells
 - 13 well points
 - 5 monitoring wells
 - 4 monitoring wells in residential neighborhood
- Hydrogeology
 - Water levels from 117 points – seven events (2004 – 2006)
 - 11 in situ hydraulic conductivity tests
 - Groundwater numerical flow model

RI Components

- Sutton Brook and Associated Wetlands
 - 28 surface water samples
 - 36 sediment samples
 - Stream gauging – 8 locations – seven events (2004 – 2006)
- Wetland and Upland Soils
 - 36 samples
- Wetland delineation
- Habitat assessment



RI Data Set

- Soils

- Upland Soils – 72 Locations
- Wetland Soils – 22 Locations

- Groundwater

- Permanent Monitoring Wells – 58 Wells
- Temporary Wells – 34 Wells/Piezometers
- Sampling Events – 13 separate events (1995 – 2006)

RI Data Set

- Surface Water – 56 Locations (1995 – 2006)
- Sediment – 76 Locations
- Leachate – 2 Locations
- Landfill gas – 8 Locations
- Ambient Air – 7 Locations

Soil, sediments, and water samples analyzed for VOCs, SVOCs, metals, and PCBs/Pest

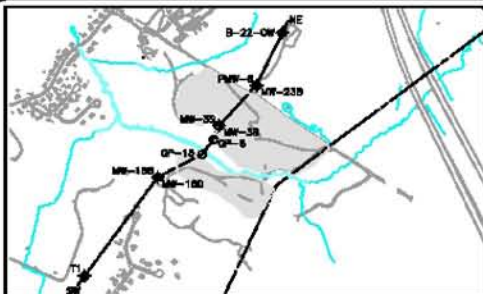
Findings - Hydrogeology

- Ground Surface

- Landfill or Wetlands

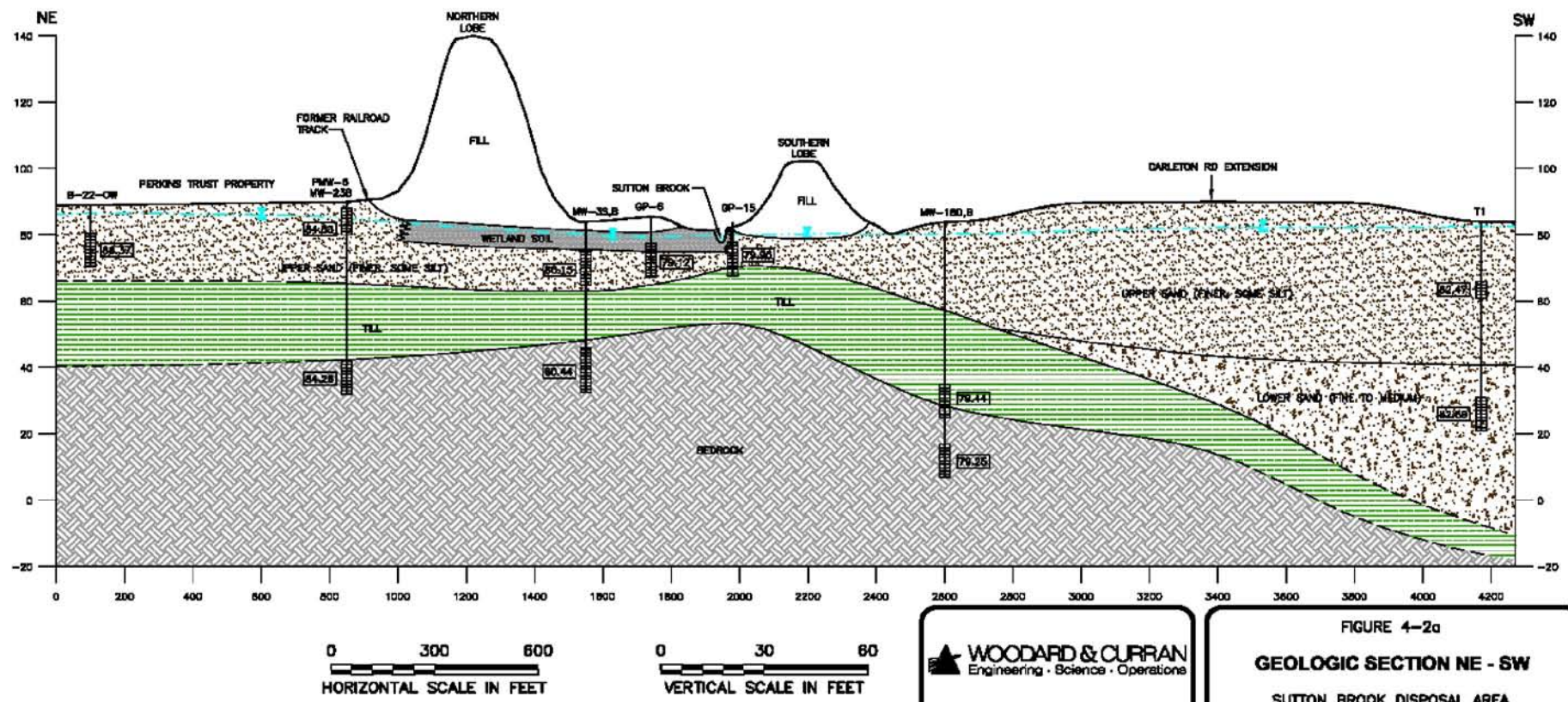
- Geology

- Sand (10 to 45 ft thick) underlain by till (5 to 20 ft thick)
- Bedrock – 20 to 60 ft bgs
- Bedrock Valley on Western Portion of Site



LEGEND

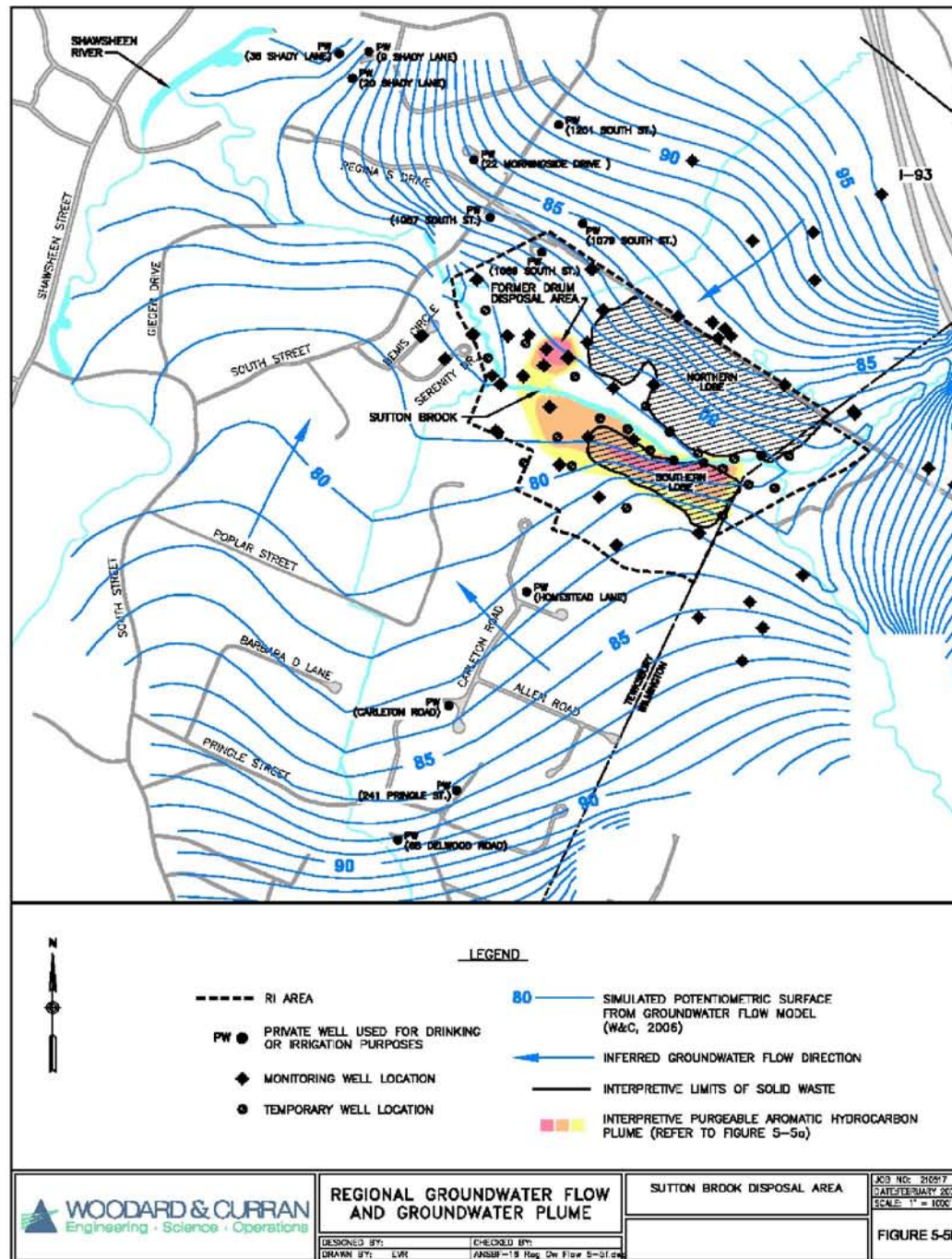
- MW-180,B | MONITORING WELL LOCATION AND IDENTIFIER
- SCREEN INTERVAL, IF KNOWN
- APPROXIMATE WATER TABLE SURFACE ALTITUDE ON DECEMBER 12, 2005
- 79.51 POTENTIOMETRIC HEAD ALTITUDE MEASURED ON DECEMBER 12, 2005
- INFERRED GEOLOGIC CONTACT
- FILL - SOLID WASTE LANDFILL AND FILL AREAS
- WETLAND SOIL - DARK BROWN TO BLACK SILT; PEAT; ORGANIC MATERIALS
- UPPER SAND - BROWN TO GRAY, MEDIUM TO FINE SAND WITH A LITTLE SILT AND SOME GRAVEL
- LOWER SAND - BROWN MEDIUM TO COARSE SAND, LITTLE GRAVEL
- TILL - DENSE, GRAY SILT, SOME FINE SAND, LITTLE GRAVEL
- BEDROCK - GRANITE OR GNEISS



Findings - Hydrogeology

■ Groundwater

- Depth – At or Near Surface to 12 ft bgs
- Brook Controls Groundwater Flow Direction
- Flatter Gradients in Deeper Groundwater
 - 1 to 2 orders of magnitude slower seepage velocities in deeper groundwater
- Upward Component of Flow Near Brook/Wetlands



Findings - Landfill Lobes

- Northern Lobe – 30 acres (1.9 million cy)
- Southern Lobe – 10 acres (0.3 million cy)
- Landfill Gases – 14-70% Methane; 15-34% CO₂; and 0.7-540 ppm total VOCs
- Southern Lobe Groundwater
 - Primarily VOCs (Toluene and Ketones) and Metals
 - 3.5 to 57 mg/l Total VOCs
- Northern Lobe Groundwater
 - Lower Concentrations than Southern Lobe
 - 0.05 to 0.84 mg/l total VOCs (1,4 dioxane and THF)
- VOCs and Metals Detected in Surface Water and Sediment in Between Two Landfill Lobes

Findings - Former Drum Disposal Area

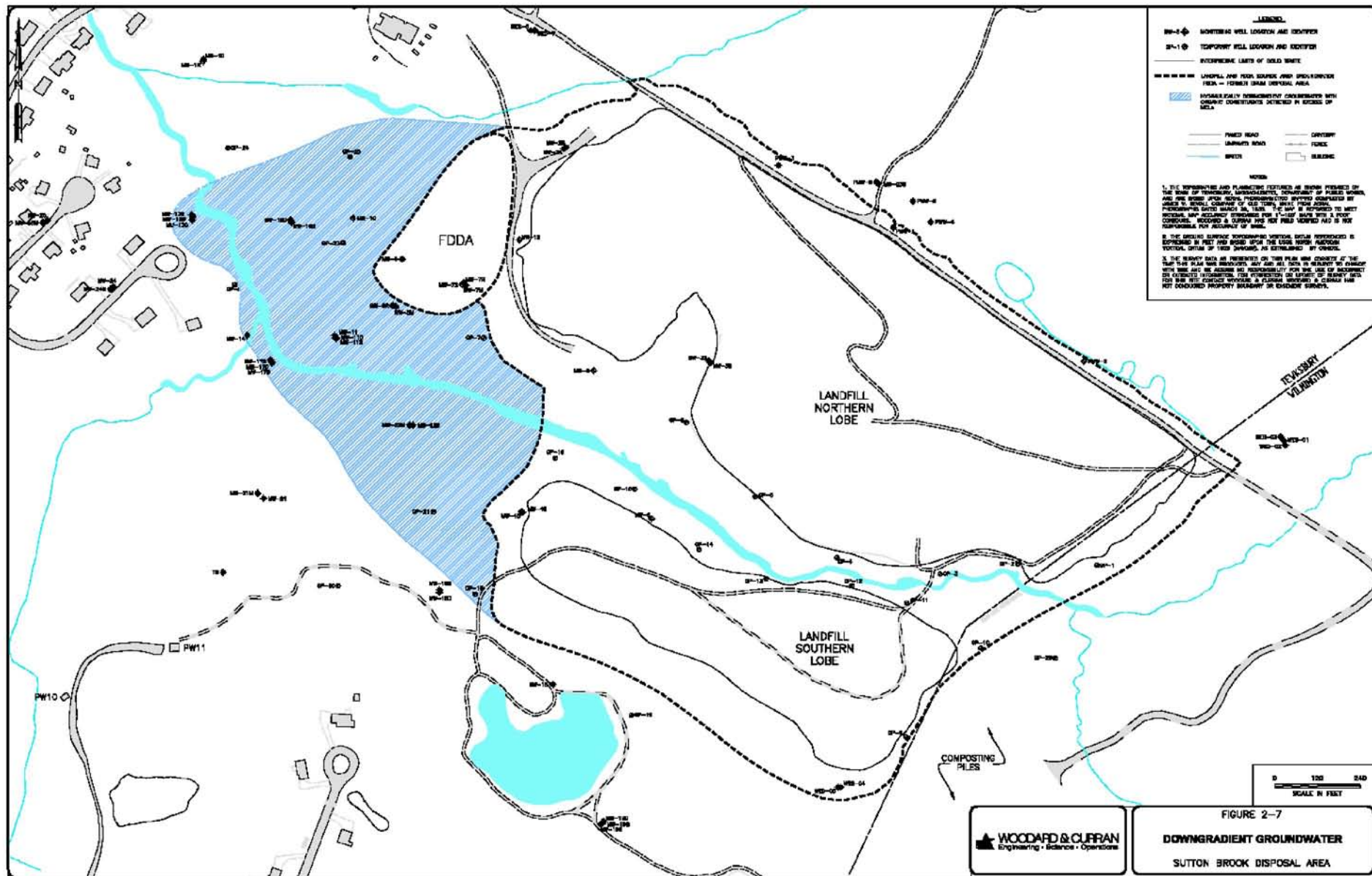
- Drums and Soil Removed in 2000
- Residual Levels of VOCs and SVOCs in Soils
 - TEX, TCA, PCE, and Phthalates
 - Highest Concentrations 4-6 ft bgs; Decrease w/ Depth
- Groundwater
 - TEX, TCA, TCE, Ketones in overburden
 - Bedrock Non-Detect for VOCs
 - Limited Plume Extent due to natural attenuation mechanisms

Findings-Former Garage & Storage Area

- Petroleum Hydrocarbons and Metals in Shallow Soils
- Groundwater not Significantly Impacted

Findings – Non-Source Areas

- Lower Concentrations of VOCs and Metals Detected in Wetland Soils and Sediments in Sutton Brook (non-site channel) and Tributaries
- Downgradient Groundwater Plumes from FDDA and Southern Lobe Source Areas exceed MCLs – contained on-site



Summary of Overall RI Findings

- Source Areas - Landfill Lobes, FDDA, GSA
- Localized Impacts to Sutton Brook and Associated Wetlands
- Concentrations of Constituents in Site-Wide Groundwater in Excess of MCLs
- Natural Attenuation Mechanisms Contributing to Plume Containment
 - Groundwater Plume does not Extend to Western Neighborhood or Downgradient Bedrock

Human Health and Ecological Risk Assessment

Human Health (HHRA) Components

- Hazard Identification
- Exposure Assessment
 - Receptors - Trespasser/recreator; hypothetical future resident, construction worker and facility worker
 - Exposure pathways
- Dose Response
- Risk Characterization
 - Risk estimates compared to EPA risk limits

Baseline Ecological (BERA) Components

- Habitats evaluated
 - Upper Sutton Brook
 - Aquatic Wetlands
 - Pond
 - Wetland Soils
 - Uplands
- Receptors – aquatic, semi-aquatic, waterfowl, and terrestrial wildlife
- SLERA – maximums compared to benchmarks
- Site-specific refinements in BERA

Findings – HHRA

- Landfill Lobes – presumed risk
- Groundwater exposures exhibited greatest potential risk
 - Hypothetical future potable use and vapor intrusion into a future on-site building
- Shallow soils (due to PAHs) in the GSA and arsenic in sediments were above risk limits

Findings – BERA

- Ecological Risk identified:
 - Upper Sutton Brook
 - Surface water (eastern reach and site channel)
 - Sediment (Site channel)
 - Aquatic Wetland
 - Surface water
 - FDDA
 - Soils
 - GSA
 - Soils

Feasibility Study

Feasibility Study

- Phase 1 – Initial Screening
 - Screen Technologies (Effectiveness, Implementability, and Relative Cost)
 - Combine Retained Technologies into Alternatives
 - Screen Alternatives
 - Separated by – Landfill Lobes, FDDA, GSA, and Non-Source Area Groundwater
- Phase 2 – Detailed Analyses
 - Evaluate and Compare Retained Alternatives
 - Separated by – Landfill Lobes, FDDA, GSA, and Non-Source Area Groundwater

Alternatives - Landfill Lobes

- LF-1 – No Action
- LF-2a/b – landfill cover system; excavate sediments; contain S.L. groundwater from discharging to brook w/vertical barrier; phased gw treatment (2a – initiate w/ MNA approach; 2b- initiate w/ active treatment)
- LF-3 - landfill cover system; excavate sediments; contain groundwater through active gw P&T;
- LF-4 – landfill cover system; re-route brook; excavate sediments; contain groundwater from impacting brook (same as LF-2b)

Alternatives - FDDA

- FDDA-1 - No action
- FDDA -2 – contain soil with cover and groundwater by extraction
- FDDA-3 – excavate soils with hydraulic containment of groundwater
- FDDA-4 – excavate soils with phased groundwater remediation (initiating with MNA)
- FDDA-5 – excavate soils with groundwater extraction

Alternatives - GSA

- GSA-1 - No action
- GSA -2 – excavate soils and dispose under landfill cover system

Alternatives - Downgradient Groundwater

- DGGW-1 - No action
- DGGW-2 – Phased approach to groundwater remediation initiating with MNA
- DGGW-3 – Groundwater containment through extraction and treatment
- DGGW-4 – Area-wide groundwater extraction and treatment

FS Evaluation

Various cleanup alternatives were reviewed to reduce unacceptable risks from:

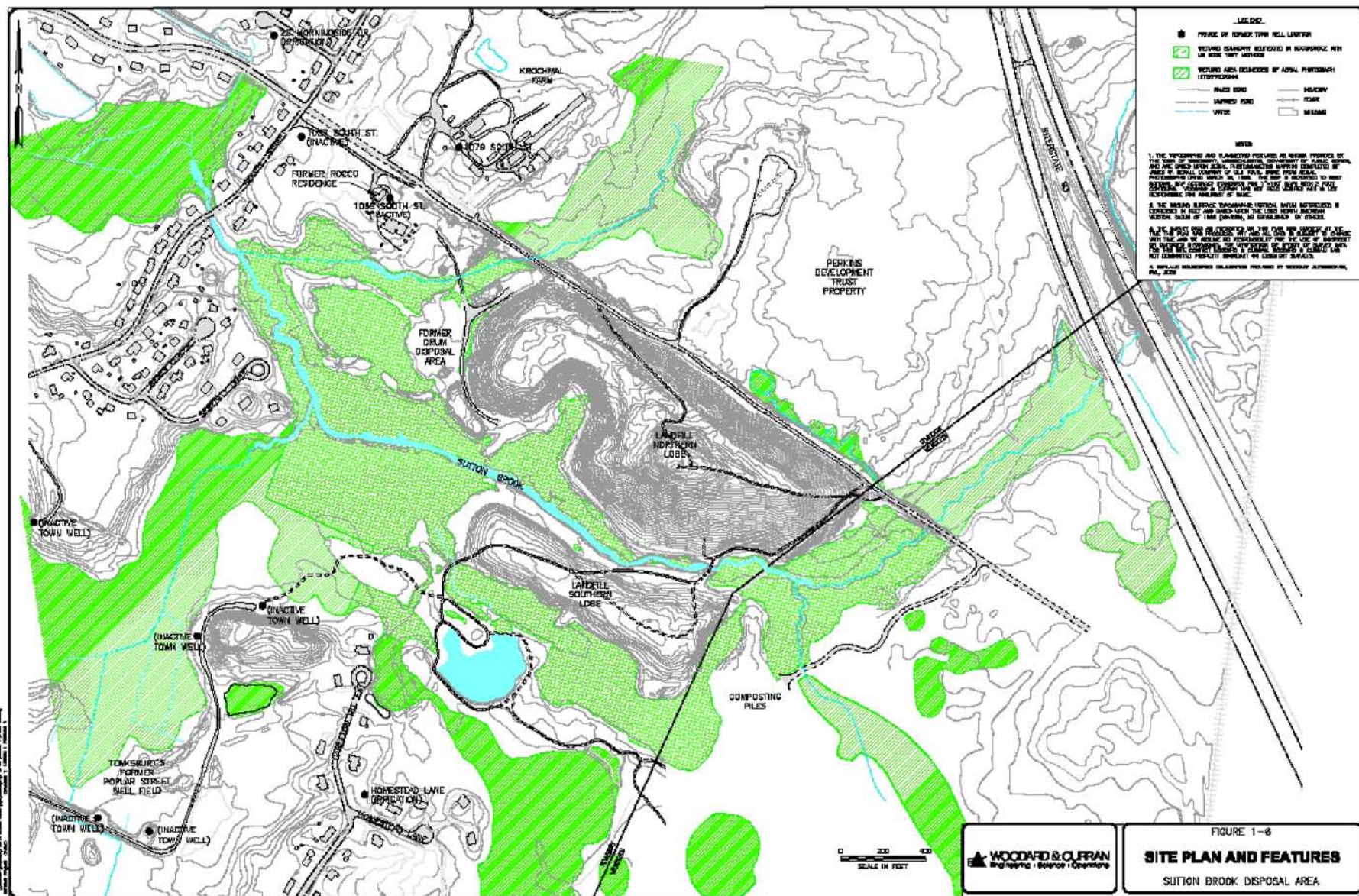
- Contaminated Groundwater
- Soil
- Indoor Air

Presumed Unacceptable Risk From

- Landfill Waste
- Sediment

Nine Criteria for Remedy Selection

- Threshold Criteria:
 - Overall Protection of Human Health and the Environment (“Protectiveness”)
 - Compliance with ARARs
- Balancing Criteria:
 - Long-term Effectiveness and Permanence
 - Reduction in Toxicity, Mobility, and Volume
 - Short-term Effectiveness
 - Implementability
 - Cost

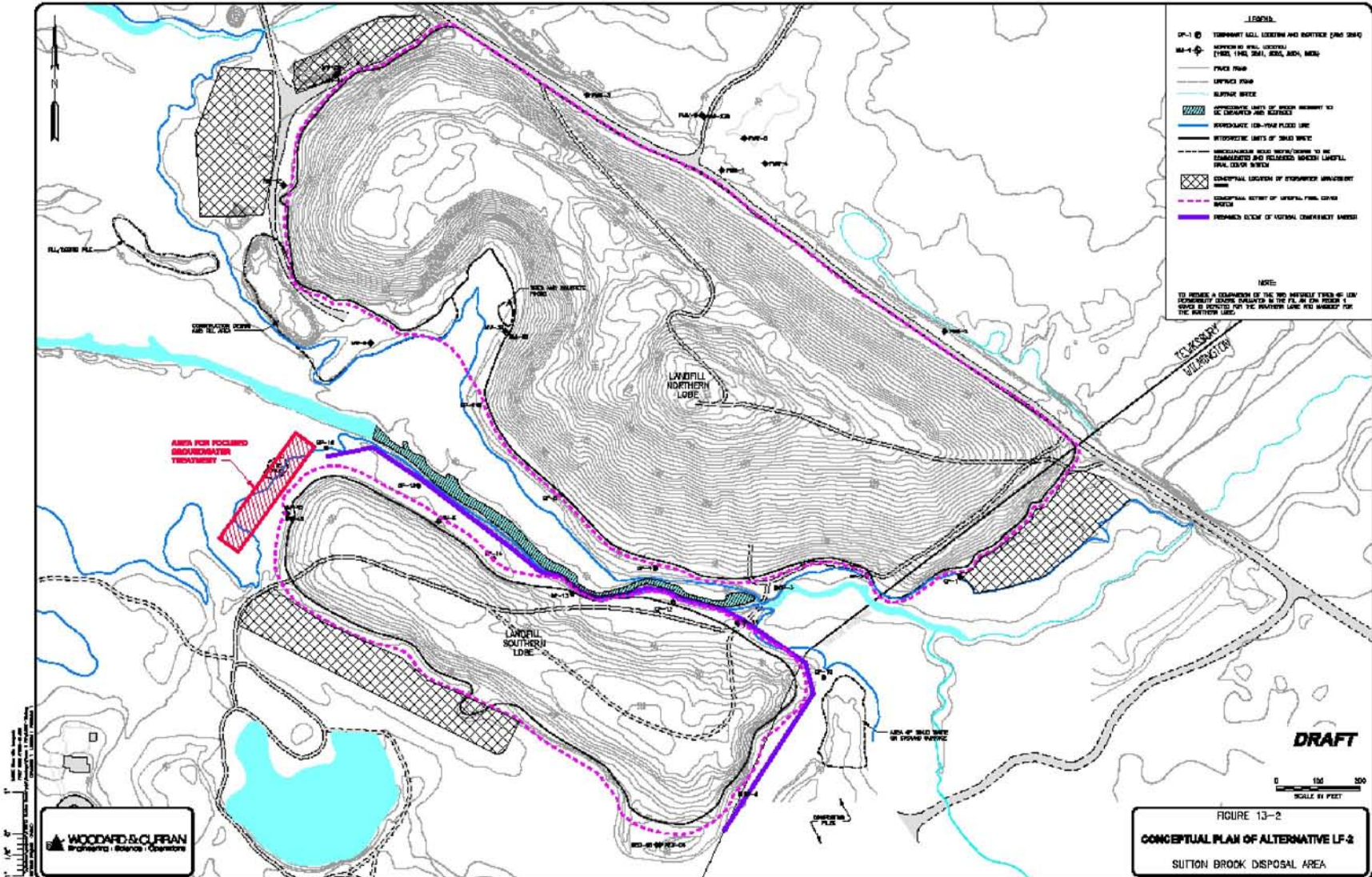


EPA's Proposed Cleanup Plan Landfill Lobes – LF-2b

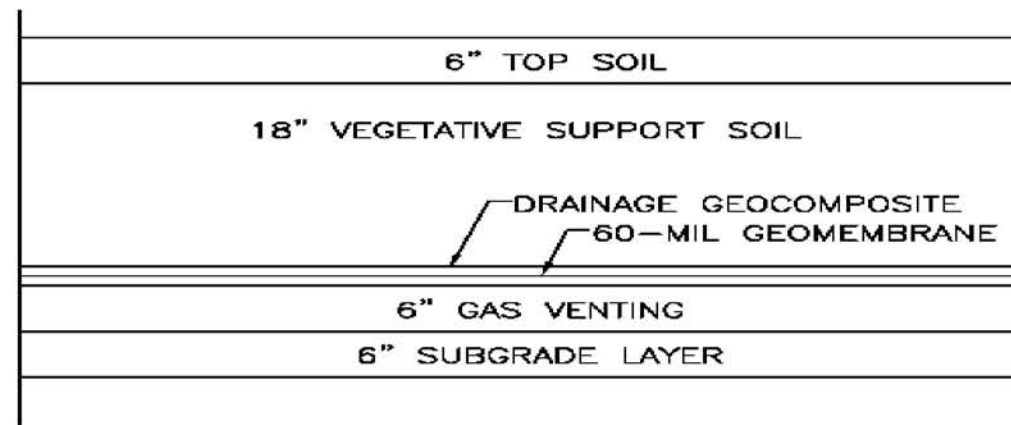
- Containment of Waste (cap)
- Vent Landfill Gas
- Excavation of Contaminated Sediment and Restoration of Wetlands and Brook
- Partial Containment of Groundwater at the Southern Lobe
- Groundwater Remediation Through Extraction and Treatment or Enhanced In-Situ Treatment at the Southern Lobe. Monitored Natural Attenuation (MNA) at the Northern Lobe.
- Monitoring and Maintenance
- Land Use Restrictions

Cost - \$ 25.2 million

LF-2b



Conceptual Cap



Comparison of Cleanup Alternatives for Landfill Lobes

	No Action	Cap Waste & Partial Groundwater Containment		Cap Waste	
Nine Criteria	#1 No Action	#2a MNA Contingent Groundwater treatment	* #2b Groundwater treatment at Southern Lobe	#3 Groundwater collection & treatment both Lobes	#4 Re-route brook & groundwater treatment
Protects human health & environment	✗	✓	✓	✓	✓
Meets federal & state requirements	✗	✓	✓	✓	✓
Provides long term protection	✗	✓	✓	✓	✓
Reduces mobility, toxicity & volume	✗	✓	✓	✓	✓
Provides short-term protection	✗	✓	✓	✓	✓
Implementable	✓	✓	✓	✓	✓
Cost (millions)	\$0	\$20.5	\$25.2	\$40.9-\$51.1	\$31.4
State agency acceptance	To be determined after the public comment period				
Community acceptance	To be determined after the public comment period				
Time to reach cleanup goals	Will not meet	65- 210 yrs	65-210 yrs	52-164 yrs	65-210 yrs

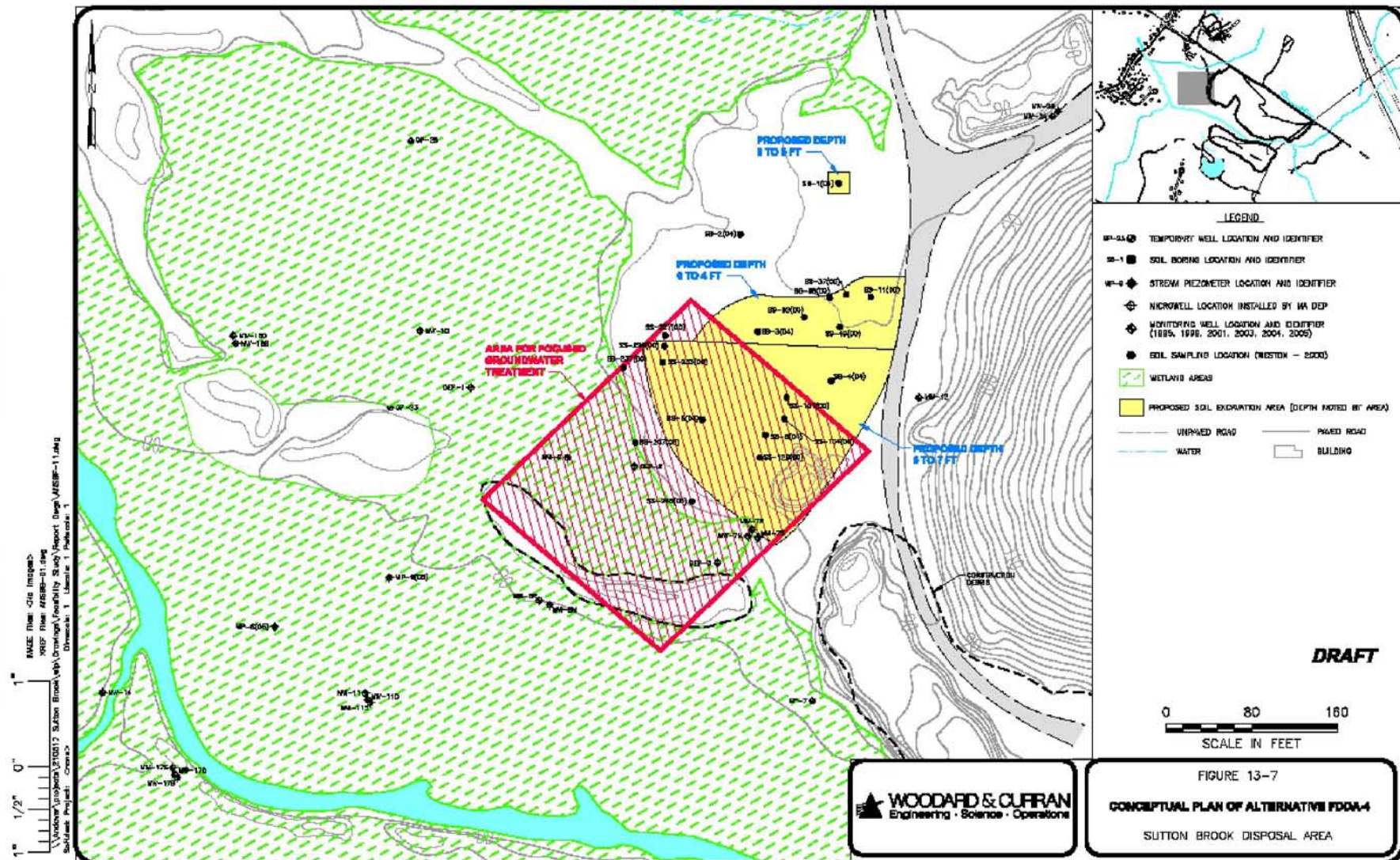
- ✓ Meets or Exceeds Criterion ✗ Does NOT Meet Criterion
 ✓ Partially Meets Criterion * EPA's Preferred Alternative

EPA's Proposed Cleanup Plan Former Drum Disposal Area – FDDA-4

- Excavation of Contaminated Soils Exceeding Cleanup Levels (Removal of Source Material)
- Consolidation of These Materials Under the Landfill Cap
- Monitored Natural Attenuation (MNA) of Groundwater.
- Contingency For Active Groundwater Treatment, If Necessary
- Monitoring

Cost - \$ 2.8 million

FDDA-4



Comparison of Cleanup Alternatives for Former Drum Disposal Area

	No Action	Cap Soil	Excavate & Consolidate Soil		
Nine Criteria	#1 No Action	#2 Contain groundwater by extraction & treatment	#3 Contain groundwater by extraction & treatment	* #4 MNA with groundwater treatment contingency	#5 Area-wide groundwater extraction & treatment
Protects human health & environment	✗	✓	✓	✓	✓
Meets federal & state requirements	✗	✓	✓	✓	✓
Provides long term protection	✗	✓	✓	✓	✓
Reduces mobility, toxicity & volume	✗	✓	✓	✓	✓
Provides short-term protection	✗	✓	✓	✓	✓
Implementable	✓	✓	✓	✓	✓
Cost (millions)	\$0	\$7.5 - \$8.3	\$7.6-9.2	\$2.8	\$9.9 - \$12.3
State agency acceptance	To be determined after the public comment period				
Community acceptance	To be determined after the public comment period				

Time to reach cleanup goals	Will not meet	30 - 134 yrs	24-89 yrs	36-103 yrs	23-85 yrs
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✓ Meets or Exceeds Criterion

✗ Does NOT Meet Criterion

✓ Partially Meets Criterion

* EPA's Preferred Alternative

EPA's Proposed Cleanup Plan Garage Storage Area GSA-2

- Excavation of Contaminated Soils
- Consolidation of Soils Under Landfill Cap

Cost - \$ 207,000

EPA's Proposed Cleanup Plan Downgradient Groundwater – DGGW-2

- Monitored Natural Attenuation (MNA) to Address Groundwater Contamination
- Contingency For Active Groundwater Treatment, If Necessary
- Monitoring

Cost - \$1.75 million

**FIGURE 2-7
DOWNGRADIENT GROUNDWATER
SUTTON BROOK DISPOSAL AREA**

FIGURE 2-7

DOWNGRADIENT GROUNDWATER

SUTTON BROOK DISPOSAL AREA

Comparison of Cleanup Alternatives for Downgradient Groundwater

	No Action	In-Situ (in place)	Groundwater Containment	Area Wide
Nine Criteria	#1 No Action	* #2 MNA Contingent Groundwater treatment	#3 Groundwater extraction & treatment	#4 Groundwater extraction & treatment
Protects human health & environment	✗	✓	✓	✓
Meets federal & state requirements	✗	✓	✓	✓
Provides long term protection	✗	✓	✓	✓
Reduces mobility, toxicity & volume	✗	✓	✓	✓
Provides short-term protection	✗	✓	✓	✓
Implementable	✓	✓	✓	✓
Cost (millions)	\$0	\$1.75	\$9.8-\$12.8	\$11.1 - \$16.8
State agency acceptance	To be determined after the public comment period			
Community acceptance	To be determined after the public comment period			
Time to reach cleanup goals	Will not meet	67-79 yrs	57-68 yrs	57-68 yrs



Meets or Exceeds Criterion



Does NOT Meet Criterion



Partially Meets Criterion



EPA's Preferred Alternative

Total Estimated Cost of EPA Preferred Alternatives

- LF-2b, FDDA-4, GSA-2 and DGGW-2
- \$ 29.98 million

Public Comment Period

- Public Comment Period ends July 28, 2007
 - Submit comments in writing by fax, email, or letter.
- Public Hearing July 18, 2007
 - Verbal comments will be transcribed
- EPA will respond in writing to comments in a “Responsiveness Summary” to accompany the Record of Decision (ROD) by the end of September 2007.

How to Comment

- Submit comments to:

**Don McElroy
EPA - New England, Region 1
1 Congress Street, Suite 1100 HBO
Boston, MA 02114-2023**

**Email or Fax by midnight 7/28/07 to:
mcelroy.don@epa.gov**

Fax: 617-918-0448 or 617-918-1291

- Provide Verbal Comments at Public Hearing at Tewksbury Public Library, July 18, 2007 at 6pm